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Environment Impact Assessment from Mining & Associated Industrial Activities on Environmental Quality of Ballari Region

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Abstract— *Bellary district is known for Iron ore deposits and many Iron and Steel plants and sponge Iron plant are established in this region.(6)*
The impact from mining and industrial activities may have impact on Environment if Environmental protection measures are not implemented.
In this paper efforts have been made to assess impact on the Air quality, Water quality and noise environment. Also an attempt has been made to suggest mitigative measures to attenuate environmental impacts on environment.
Keywords— *EIA, AAQ,NAAQ, Mitigative measures, CPCB, KSPCB.*

I. INTRODUCTION

Mining and steel Industrial activities contribute towards national development, Implementation of sustainable development concepts in these activities will ensure no significant environmental impacts and industrial development. The Mining activites caters the need of iron and steel plants, sponge iron plant and also other consumers. Steel is essential commodity for common man and for national development.(6)
Bellary region is considered as one of the major hot spot of the Karnataka State due to problems arising out of mining and other associated industries. Accordingly environmental impact assessment(EIA) of Bellary region has been under taken considering Air, Water and Noise components of Environment

II. OBJECTIVE

To assess the environment impact from the mining and associated industry and environmental quality of Bellary region. Environmental impact on environment include Air, Water, Noise quality within 10 KMS radius of Bellary have been studied to assess the impact.

III. MATERIALS & METHODS

a. Description of study areato assess the impact of mining and other associated industry baseline environmental quality with 10 K.M Radius of Bellary studied.
b. Environmental quality parameters The environmental component include air quality, and noise level materialized data Bellary considered for study.

METEOROLOGICAL DATA

Meteorological Data to assess wind direction and speed, temperature, humidity, generated during study period at Bellary used for this study.

AMBIENT AIR QAULITY

Ambient air quality data generated from 2013 to 2016 for the parameter PM-10, PM - 2.5, SO 2 and NO x with in 10 Kms. Radius at 6 AAQM Stations.

WATER QUALITY

Surface water samples collected at 1 locations to assess impact on water environmental

NOISE LEVEL

Day time and night time noise in Db(A) collected at 1 locations to access impact of noise

IV. RESULTS & DISCUSSIONS

The Meteorological and environmental data collected in Bellary region during the study period

METEOROLOGICAL DATA:

The Meteorological data during2016 which includes wind speed,Wind Direction, and ambient temperature, relative humidity are collected and summarized in table-I.

Table.1: Meterological data

Sl.No	Parameters	Maximum	Minimum
1	Temperature o C	43.5	13.7
2	Relative humidity %	97	17.0
3	Wind Speed in m/s	0.8	8.3
4	Predominant direction	WSW/WNW/SE	

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AMBIENT AIR QUALITY DATA

The results of Ambient Air quality data monitored in study area for PM-10, PM 2.5 SO 2 and NO x with in 10 Kms. Radius at 8.00 AAQM Stations are given in Table.

Table.2: Summary of Ambient Air Quality Data

SL. No.	AAQM LOCATION	PM 10			PM 2.5			SO 2			NO x		
		Min	Max.	Avg.	Min	Max.	Avg.	Min	Max.	Avg.	Min	Max.	Avg.
1.	Bellary Municipal Corporation	29.4	136.0	88.9	20.2	43.4	31.6	5.3	10.4	9.3	8.2	17.1	14.2
2.	Regional Office KSPCB Bellary	30.1	102.4	71.6	22.2	48.7	35.6	7.3	9.2	7.8	10.2	14.2	11.6
3.	Halkundi Village	24.0	43.0	32.6	8.6	26.2	16.8	2.1	4.9	3.1	4.9	11.2	8.2
4.	Belgal village	26.0	55.0	31.8	13.6	29.6	16.1	3.0	11.1	6.8	4..9	33.1	8.9
5.	VeniVerapura	28.6	143.6	92.1	14.9	72.8	46.8	5.2	14.4	8.8	11.6	46.2	26.5
6.	Janikunte	24.2	89.6	37.8	16	45.6	18.9	3.6	8.2	2.1	3.8	11.8	4.9

All units are in ug/m3

Air Quality Impacts: AERMOD was developed by AMS/EPA Regulatory Model Improvement Committee (AERMIC). To assess the Air Quality Impacts AERMOD version 8.8 used. Meteorological data for winter season is used.

To Predict the Air quality impact AERMOD 8.8 model run to assess the contribution in Ground level Concentration from point sources.

The Baseline Air Quality and Contribution to Ground Level Concentration is given in the Table

Table.3: Summary of Ambient Air Quality Impact

SL. No.	AAQM LOCATION	PM 10			PM 2.5			SO 2			NO x		
		Base line	GLC Pred	%	Base line	GLC Pred	%	Base line	GLC Pred	%	Base line	GLC Pred	%
1.	Bellary Municipal Corporation	88.9	12.6	14.1	31.6	4.1	12.9	9.3	2.7	29.1	14.2	5.1	35.9
2.	Regional Office KSPCB Bellary	71.6	8.1	11.3	35.6	3.8	10.6	7.8	2.2	28.2	11.6	4.1	35.3
3.	Halkundi Village	32.6	7.2	22.0	16.8	3.2	19.1	3.1	1.1	35.4	8.2	2.6	31.7
4.	Belgal village	31.8	9.3	29.2	16.1	4.3	26.7	6.8	2.5	36.7	8.9	3.1	34.3
5.	VeniVerapura	92.1	24.6	26.7	46.8	9.5	20.2	8.8	2.9	32.9	26.5	8.3	31.3
6.	Janikunte	37.8	9.7	25.6	18.9	4.7	24.8	2.1	0.5	23.8	4.9	1.4	28.5

All units are in ug/m3

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WATER QUALITY DATA

The results of water quality data monitored during study period are given in the table 3

Table.4: Water Quality of – Surface Water T. B. Dam Water

Sl.No.	Parameter	Values
1.	Ph	8.5
2.	Conductivity (umhos/cm)	236
3.	TDS (mg/l)	160
4.	Turbidity NTU	18
5.	T.Hardness as Caco3 (mg/l)	78
6.	Calcium as Ca (mg/l)	19.2
7.	Magnesium as Mg (mg/l)	7.3
8.	Chlorides as cl(mg/l)	22
9.	Sulphates as So4 (mg/l)	27.2
10.	Nitrates as No3 (mg/l)	0.13
11.	Fluoride as F	0.2
12.	BOD	2.7
13.	Alkalinidy as CaCo3 (mg/l)	70
14	Total Iron as Fe	0.79

NOISE LEVEL

The results of noise level monitored during study area are given in Table 4

Table.5: Noise Levels

Locations Gandhinagar, Bellary

Time	CPCB NORM	MIN. dB(A)	Max. dB(A)	Average dB(A)
Day Time	75	35.8	63.6	57.6
Night time	70	33.9	56.4	46.2

The PM 10 Levels are exceeding the NAAQ limits of 100 ug/m3. It was envisaged that the major contribution is from Transportation of Vehicles in unpaved roads and contribution from industries and other sources.

From Water quality monitoring results it was observed that the surface water meets the CPCB stipulated limit of surface water quality Part –C.

For ground water most of the parameters meets the standard of IS10500.

The Ambient noise level meets the norms of CPCB limits during day and night time.

V. CONCLUSION

The present study indicates that the Ambient Air quality for PM 10 exceeding limits of NAAQM limits of 100 ug/m3. As this is attributed namely due to transportation of vehicles.

The following mitigatives measures has to be ensured.

- The unpaved roads has be paved
- By pass roads adjacent habitation is to be provided
- Preventing over load and spillages on the Road

With this measures and ensuring emission level within the limits from associated industries PM 10 Levels can brought within the limits.

To sustain water quality industries and Municipalities has treat the effluents/sewerage within the limits and maximizing recycle/reuse.

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